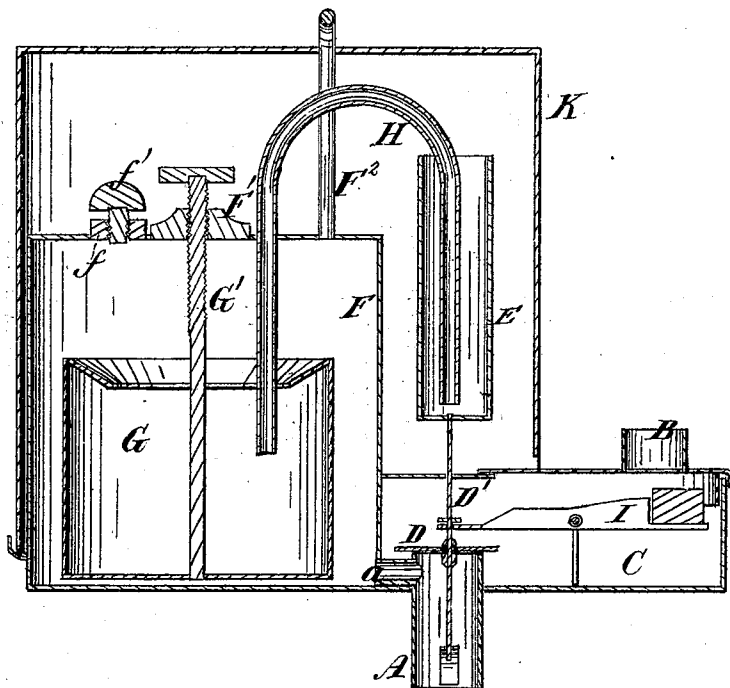


W. L. HORNE.
Regulators for Fluids.

No. 148,212.

Patented March 3, 1874.



Witnesses.
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UNITED STATES PATENT OFFICE

WILLIAM L. HORNE, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN REGULATORS FOR FLUIDS.

Specification forming part of Letters Patent No. 148,212, dated March 3, 1874; application filed August 20, 1873.

To all whom it may concern:

Be it known that I, WILLIAM L. HORNE, of Chicago, in the county of Cook and State of Illinois, have invented a certain Improved Pressure-Regulator for Gas and other Fluids, of which the following is a specification:

The nature of my invention consists in governing a normally-balanced valve, controlling the flow of the gas or other fluid by a changing column of water or mercury, which is carried in a vessel superimposed upon the valve, and which communicates, through a primed siphon, with a body of the same liquid contained in an open reservoir on a lower level, and exposed to the pressure of the fluid on the induction side of the valve. The liquid is automatically pumped into and out of the vessel on the valve by the siphon, according as the pressure in the main increases or decreases, and the valve in consequence throttled, more or less, so as to maintain a uniform given pressure in the service-pipe under varying pressure in the main.

The annexed drawing represents a vertical longitudinal section of my improved pressure-regulators.

A is the pipe proceeding from the main, and B the pipe by which the fluid enters the service-pipes. Both open into a tight box, C, the inner end of the pipe A being controlled by a valve, D, whose stem D', projecting both below and above the same, passes with its upper end through the top of the box C, and carries an open cylindrical vessel, E. The pipe A also communicates, through a branch, a, with the air-tight chamber F, in which is suspended an open tank or reservoir, G, by a screw-spindle, G', passing through a nut, F¹, in the top of the chamber F. By this means the tank may be readily adjusted vertically with reference to the vessel E of the valve. Ordinarily, the top of the tank will be on about a level with the bottom of the vessel E. H is a siphon, the long leg of which dips into the tank G, while its short leg enters the vessel E, and reaches to near the bottom thereof. The tank is filled about two-thirds full of water or mercury, covering the end of the long leg of the siphon, which remains continually primed, its short leg being also covered with a corresponding liquid in the vessel E. The level of the liquid

in the vessel E will be at a greater or lesser elevation above that in the tank, according as the pressure of the fluid in the main increases or diminishes; and the elevation of the tank will be so regulated, by means of the adjusting-screw G', that under a normal pressure the liquid in the vessel E will just rise above the end of the short leg of the siphon.

The respective areas in cross-section of the fountain G and vessel E must always bear such proportions to each other and to the valve-opening, that, under an augmented pressure in the main, and consequent change in the level of the liquids in the fountain and weighting-vessel, the increase of volume of liquid in the latter will exactly counterbalance the excess of pressure in the main, and throttle the valve to maintain the desired uniform pressure in the service-pipe. In the example illustrated, the area of the vessel E is equal, or nearly so, to that of the valve-opening, and the fountain G is of comparatively large diameter, so that the change of level of the liquids will be mainly noticeable in the weighting-vessel. This relative construction may be followed wherever the fluctuations of the pressure are small, but is not practicable where the pressure varies greatly; in that case, the respective dimensions of the fountain and weighting-vessel should be reversed.

The valve has a little play on its stem, to adjust itself on its seat, and is balanced by a weighted lever, I, when the vessel E contains a column of liquid due to the normal pressure.

Water or mercury can at any time be supplied to the tank G through an aperture, f, in the top of chamber F, which is ordinarily closed air-tight by a screw-plug, f'. The chamber F is provided with a fixed shackle, F², and it, together with the siphon and the vessel E, is to be inclosed in a case, K, through which the shackle projects to receive a padlock for securing the case, so that the apparatus cannot be tampered with by unauthorized persons.

The apparatus is more especially designed for governing the supply of gas to burners; but it may, with equal advantage, be employed for regulating the flow of water.

In case mercury is used, it should be covered or sealed by a thin film of oil or glycerine, to prevent its evaporation.

The tank G will be provided with a waste-hole, so that the excess of liquid poured in can run out.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A valve for governing the flow of a fluid, weighted by a column of liquid of greater specific gravity than such fluid, the height of which column is automatically increased or diminished by the pressure of the fluid upon a fountain in the main, according as it is augmented or reduced, substantially as specified.

2. The combination, in an apparatus for governing the flow of a fluid by a changing column of water or mercury, of a valve, D, an open vessel, E, carried by the valve and ex-

posed to atmospheric pressure, an open tank, G, exposed to the pressure of the fluid in the main, and a siphon, through which the liquid in the tank G communicates with that in the vessel E, all substantially as specified.

3. The tank G, in combination with the adjusting-screw spindle G', siphon H, vessel E, and valve D, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

W. L. HORNE.

Witnesses:

D. P. HOLLOWAY,
B. EDW. J. ELLS.